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Measuring Outcomes in the Canadian Health Sector: Driving Better Value from Healthcare

Better measurement of health outcomes, particularly from the patient's perspective, holds great potential to improve quality of care and advance Canada's healthcare goals.

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The Study In Brief

While Canada has a well-established tradition of transparency and accountability for health-system performance comparisons, few measures of outcomes are reported. In this *Commentary*, we examine what outcomes measurement is; the state of outcomes measurement in Canada; and offer recommendations so that the generation of better information on health system outcomes can help achieve greater value in the health sector.

Outcome measures help to better understand how effectively the health system achieves its goals, support better decision-making by relating investment decisions to outcomes, and better match the delivery of health and social services to the evolving needs of populations and patients. From a research perspective, outcome measures help better understand how policy interventions and healthcare services can contribute to achieving targeted outcomes and their role in the broader social determinants of health. And from a democratic perspective, publicizing outcome measures can empower patients, families and communities to engage in the policy debate about which outcomes matter most and at what cost – and in the ways healthcare should be delivered.

Among our key recommendations:

- The federal and provincial governments should complement current data with outcome measures of relevance to patients, clinicians, system managers and policy practitioners. In particular, patient-reported outcome measures and patient reported experience measures should augment datasets currently available in pan-Canadian clinical registries.
- Organizations with a mandate to report publicly on health-system performance, such as the Canadian Institute for Health information and provincial health quality councils, should collect outcomes data and report publicly on outcomes, filling current gaps in outcomes measurement and public reporting.

The ultimate yardstick of success, however, will not be the quantity and accuracy of Canadian healthcare outcomes data, but rather how this information is put to use by clinicians, system managers and policy-makers to advance health system goals. Better measurement can only take us so far. More critical is how the data will be aggregated, analyzed, risk-adjusted and, most importantly, how public policy and other interventions will incent professionals to improve outcomes and patients to demand better outcomes and value from the healthcare sector.

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Measuring health outcomes more effectively holds great potential to improve the quality and effectiveness of healthcare in Canada, and ensure the system is delivering value for money.

According to the World Health Organization (WHO), a healthcare system's goals are to improve health; be responsive to the needs of patients and the public; protect patients from financial hardship when they are sick; and to achieve these objectives in an efficient manner (WHO 2008). For their part, Canadians also expect to have access to quality healthcare services when and where they need them, to be treated with respect and be involved in decisions about their treatment. Canada devotes considerable resources toward achieving these goals. Total healthcare expenditures were projected to reach $219.1 billion in 2015, or $6,105 per person (CIHI 2015). Canadians want their health system to be the best it can be while providing value for money, so a basic and important question is whether this investment is meeting their primary goals.

Yet, there are important areas of the Canadian health system that are not subject to adequate measurement. Where indicators of health-system performance are abundant and allow for comparisons and learning, they most commonly focus on inputs, resource utilization and access to care, or more recently, quality of care. While these indicators are important, they do not provide a complete picture of how the Canadian healthcare system is performing in relation to its primary goals.

In contrast, other public services have made substantial progress in measuring outcomes. The education sector, for example, reports pan-Canadian indicators of educational performance, focused mainly on student achievement in core areas. These initiatives are not without their critics, particularly for being too narrow in scope. Nevertheless, the use of education outcome indicators has been very effective at stimulating policy debates among, and within, provinces about how to improve outcomes. These indicators have also promoted best practices across the country related to teaching and learning strategies.

In the health sector, there are advanced approaches to the measurement and reporting of outcomes that show more can be done to better measure outcomes in Canada. The UK National Health Service (NHS) Outcomes Framework, for one, provides an overview of key expectations for the healthcare systems and results for these indicators are regularly reported publicly (Table 1). Interestingly, a number of these indicators are already reported by the Canadian Institute for Health Information (CIHI), but with notable gaps around the measurement of patient experience and harm to patients.

From an accountability and transparency perspective, one can use outcome measures to better understand how effectively the health system achieves its goals – and delivers value to citizens. From a policy perspective, outcome measures

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Table 1: UK NHS Outcomes Framework (2015-2016)

Domain	Key Outcome Indicators
Preventing People from Dying Prematurely	· Potential years of life lost (from causes amenable to healthcare interventions) · Life expectancy at age 75 · Neonatal mortality and stillbirths
Enhancing Quality of Life for People with Long-term Conditions	· Health-related quality of life for people with long-term conditions
Helping People Recover from Ill Health or Following Injury	· Emergency admissions for acute conditions that should not usually require hospital admission · Emergency readmissions within 30 days of discharge from hospital
Ensuring People Have a Positive Care Experience	· Patient experience of primary care · Patient experience of hospital care · Friends and family test · Patient experience categorized as poor or worse (primary and hospital care)
Treating and Caring for People in a Safe Environment and Protecting Them From Avoidable Harm	· Deaths attributable to problems in healthcare · Severe harm attributable to problems in healthcare

Source: UK NHS.

support better decision-making by relating investment decisions to outcomes pursued as exemplified through health technology assessment and its expansion to other types of investment decisions. From a managerial perspective, outcome measures help better match the delivery of health and social services to the evolving needs of populations and patients. They also focus on the accountability of regional health authorities, care providers and front-line care staff on key results. From a research perspective, outcome measures help better understand how policy interventions and healthcare services can contribute to achieving targeted outcomes and their role in the broader social determinants of health. And, finally, from a democratic perspective, publicizing outcome measures can empower patients, families and communities to engage in the policy debate about which outcomes matter most and at what cost – and in the ways healthcare should be delivered.

Most countries are still in the early stages of developing better outcomes measurement, with few quantifiable examples of such measures producing better performance (CIHI 2012, Raleigh and Foot 2010). That said, we see performance measurement as a necessary step to steer policy and efforts to improve healthcare delivery. Recently, the Harvard Business School's Michael Porter and Dr. Thomas Lee (2013) argued similarly about the necessity to better understand health outcomes and costs to

patients in order to achieve value-based healthcare, which they define as "outcomes that matter to patients relative to the cost of achieving those outcomes."

The ultimate yardstick of success, however, will not be the quantity and accuracy of Canadian healthcare outcomes data, but rather how this information advances health-system goals. Better measurement can only take us so far. More critical is how the data will be aggregated, analyzed, risk-adjusted and, most importantly, how this data will incent or inform better performance among professionals and patients.

While Canada has a well-established tradition of transparency and accountability for health-system performance comparisons, few measures of outcomes are reported. In this *Commentary*, we examine what outcomes measurement is; the state of outcomes measurement in Canada; and offer recommendations so that the generation of better information on health system outcomes can help achieve greater value in the health sector.

Part 1. Outcomes Measurement: What Is It?

Outcomes Measurement in Healthcare

The Oxford English Dictionary defines "outcome" as "the way a thing turns out; a consequence." In healthcare, we are concerned with how things turn out after interventions to prevent, treat or cure health problems. This requires, in simple terms, that we are able to measure health states before interventions and at various points thereafter. These could include, for example, measures of vision for cataract surgery patients, or pain and mobility measures for joint replacement surgery. We might be able to say that the wait time for a hip replacement fell within acceptable limits and that the procedure was carried out according to current best practices, but unless we can measure health before and after the intervention, we cannot judge whether or not it had a beneficial impact.

In other words, we need to be able to identify the desired consequences of care (the ones that matter to patients) before measuring interventions and results. Capturing this flow will inform us about whether we are doing the appropriate things and how well we are doing them. As Michael Wolfson, a Canada Research Chair in Population Health Modelling/Populomics at the University of Ottawa, observes: "The most critical requirement is routine and repeated measures of patients' health status. There is no way to tell whether or not an intervention had a beneficial impact without knowing whether the individual's health status after the intervention was better than before (Wolfson 2011, p.271)."

This apparently simple idea is not new. One hundred years ago, E.A. Codman, a US surgeon influenced by scientific management principles, advocated for his "end-result idea," the notion that "every hospital should follow every patient it treats long enough to determine whether or not the treatment has been successful, with a view to preventing a similar failure in the future (quoted in Donabedian 1989, p.238)." More recently, a renewed interest in outcomes measurement has been fuelled by the quality improvement movement that took hold in healthcare in the 1990s, drawing heavily from examples initiated by William Deming and others in the industrial sector (Colton 2000).

Measuring outcomes in healthcare, however, is different from other areas. In most economic sectors, profit, growth, market share and other measures are key performance indicators. In some ways, healthcare reverses this relationship. As Don Berwick, past president and chief executive officer of the Institute for Healthcare Improvement in Cambridge, Mass., observes, "You want hospitals that seek to be empty, doctors that seek to be idle, machines that are few (Boseley 2012)." A perfectly healthy population would not need to visit hospitals, see doctors or use medical equipment. Although healthcare leaders and policymakers increasingly view the measurement of healthcare

outcomes as essential to improving overall care, outcomes measurement is proving to be a complex endeavour.

The connection between care provided and subsequent health status is not always clear or easily ascertained, particularly over longer timeframes and when multiple care providers, settings and interventions are involved. To further complicate matters, health is not exclusively produced by healthcare. It is also shaped significantly by other important determinants such as education, housing, environment, employment and social integration.

Types of Outcome Measures: the 5 Ds

Outcome measures have been captured under the rubric known as the "5Ds" (Lohr 1988): death, disease, disability, discomfort and dissatisfaction (Table 2).

It has long been recognized that death rates alone are not sufficient for evaluating the quality of healthcare. There are several reasons for this. First, although many deaths can be prevented by high-quality healthcare, some cannot, at least not with the current state of medical knowledge. For example, effective treatment is still not possible for most patients with pancreatic cancer.

Second, the death rate from many preventable diseases, such as coronary artery disease, is related not only to the quality of healthcare but also to other factors such as smoking rates. If smoking rates were to decrease over the next decade, the number of deaths due to coronary artery disease might decrease, even if the quality of healthcare worsened. Income, education, housing and many other social determinants of health similarly influence health, but the levers available to influence them often lie outside of the span of control of health ministries.

Third, death occurs too rarely (fortunately) for it to be used as a quality indicator for many health conditions. For example, patients are very unlikely to die from osteoarthritis, but their quality of life may be significantly affected.

Meanwhile, a number of morbidity measures developed in the mid-1960s have made population-level information about disease (such as incidence, prevalence and severity) more accessible (Bergner 1985), providing an additional dimension to the study of health status. By the mid-1970s, indices examining function and disability (related to aging or disease) had been developed, adding a third dimension (Bergner 1985, Tennant and McKenna 1995).

In the 1970s, a new genre of health-related, quality-of-life measures were developed that moved beyond death, disease and functional impairment to include physical and mental well-being (Greenfield and Nelson 1992). At the same time, the concept of patient satisfaction (Mpinga and Chastonay 2011) began to be used to measure patient perceptions of their care.[1]

The more focused the aim of measurement, the more detailed data sources and measures are required (Table 2). Disease-specific outcome measures, such as how far a patient with a chronic lung disease can walk within six minutes, may be more useful than death rates alone and have a better, but still limited, actionability when it comes to health-system improvement. Similarly, reducing the prevalence of measles, hypertension and diabetes, increasing five-year survival rates for cancer and reducing impairment caused by problems of vision, mobility or hearing are all useful measures for assessing system performance.

The disease-based measures also align well with medical reasoning and the logic with which most

1 Notable examples include the EuroQol EQ-5DTM, the 36-item Short Form Health Survey (SF-36) and the Health Utilities Index.

Table 2: The 5Ds Rubric

Domain	Measurement Goal	Examples of Indicators
Death	Quantification of life and death	· Potential years of life lost, avoidable mortality, life expectancy
Disease	Understand prevalence and incidence, disease severity, responsiveness to treatment	· Symptoms, physical signs, laboratory abnormalities, prognosis · Generic and disease-specific measures
Disability	Level of functioning/impairment	· Disability adjusted life expectancy · Days of disability, activity restrictions · Activities of daily living · Generic and specific disability measures
Discomfort	Level of discomfort	· Pain, nausea, dyspnea, emotional responses (e.g., distress, anger, sadness) · Generic and disease-specific measures · Quality adjusted life years
Dissatisfaction	Patient perceptions of the quality and other aspects of care	· Quality, access, availability, cost of care · Patient experience

Source: Lohr, 1988.

medical services are organized (e.g., vaccination services, primary care, cancer services) while disability measures come closer to capturing the experience of health problems, albeit on a functional level. Meanwhile, patient satisfaction assessments provide useful information about the perceptions patients have of their healthcare experiences.

An increasingly widely used measure of health improvement that is also used to guide resource allocation in some jurisdictions is the quality-adjusted life year (QALY) (Weinstein, Torrence and McGuire 2009). Unlike most of the measures discussed above, which focus on particular treatments, QALYs enable comparisons across different diseases, which is why they are so useful for resource allocation.

QALYs take into account the increase in life expectancy that is expected from an intervention, but because living longer alone may not be a sufficient measure of success, QALYs also take into consideration changes in quality of life. In a comparative cost utility analysis, the benefits of a new intervention in terms of cost per QALY are compared to the costs of existing interventions. Disability measures, patient satisfaction and health-system responsiveness measures can all improve

the accuracy in which QALYs are expressed, which together help to inform healthcare decisions that are made with limited public resources.

Patient Perspectives

Until recently, outcomes were determined from a clinical perspective. Was the operation a success? Has the wound healed? Increasingly, though, the paradigm is shifting toward outcomes determined from a patient perspective. Was the operation a success for me? Can I walk better? Do I feel better? Can I function optimally, at work and in my personal life?

Formally, this shift is reflected in what are called patient-reported outcome measures (PROMs), which reflect patients' views of their symptoms, their functional status and their quality of life, along with patient-reported experience measures (PREMs). PREMs focus on actual, more easily measurable care experiences such as whether the patient was seen on time, whereas PROMs focus on outcomes experienced and reported directly by patients.

PROMs were initially used as research instruments to supplement information gathered through clinical trials but, as the patient voice becomes predominant in the context of outcome measurement, their use is expanding into healthcare performance assessment, providing a much needed extension of the existing suite of outcome measures.

There are two broad categories of PROMs: disease specific and generic (Black 2013). The former focus on the symptoms and impact of specific health conditions, while the latter collect information on pain, function, mental health and, more generally, the ability to perform activities of daily life. In this way, PROMs go beyond function and health status to measure quality of life, a dimension that reflects the ways in which patients perceive and react to their health status and situate it in the broader context of their lives. As a result, patient-reported outcomes provide a much needed patient-centred perspective on the health status measures of disease, disability and well-being.

Part 2. The State of Outcomes Measurement in Canada

Canada has made progress on outcomes measurement in recent years. Since the early 1990s, several provincial exemplars have emerged, while the two leading national health information agencies, the Canadian Institute for Health Information (CIHI) and Statistics Canada have brought about significant improvements in the country's health information infrastructure. Population health outcomes can be assessed to some extent at the national, provincial and regional level through instruments such as the Canadian Community Health Survey (CCHS) and the Commonwealth Fund Survey, which incorporate validated and widespread measurement tools such as a health-utilities index and a short-form suite of questionnaires.

Standardized databases enabling provincial comparisons were also developed in the areas of home and long-term care, rehabilitation and mental health, all of which derive their information from longitudinal client assessments, which involve repeated observations over multiple years. In addition, provinces have invested in the development of a small number of specialized longitudinal clinical databases (clinical registries). CIHI is also involved at the international level, working with the Organisation for Economic Co-operation and Development (OECD) on the development of internationally comparable PROMs and data collection of health indicators for primary care, mental health, patient safety and experience.

How does Canada Compare Internationally?

Despite notable progress in Canada, much remains to be done if we are to better use outcomes measurement to improve population health, patient

Table 3: Canada's Comparative Progress on Outcomes Measurement

5Ds Domain	Canada's State of Outcomes Measurement	International Trends
Death	· Ability to analyze in-depth all deaths that occur in hospital. · Greater ability to link death records to health records or to disease registries. · Analysis of deaths is limited to the principal cause.	Leading countries moving beyond estimates of life expectancy or simple mortality measurement to quantification of excess mortality for sub-categories of the population (e.g. people with mental health issues), linking vital statistics to disease-based registries. Example: excess mortality for people with mental health conditions (South Korea, Slovenia, Denmark, New Zealand, Finland, Israel, Sweden) based on linkage of death data and disease-based registries.
Disease	· Limited number of pan-Canadian clinical registries (cancer, hip/knee replacement, organ replacement, and multiple sclerosis). · Canadian Community Health Survey. · Canada considering collecting PROMs as part of targeted clinical registries. · Eight provinces and territories have adopted common standards (interRAI) for home and continuing care, mental health, including information on outcomes. · Limited ability to systematically track stages of development/severity of chronic conditions.	Extensive and advanced use of clinical registries in Sweden, Denmark, UK, US. Established use of PROMs in the UK and increasingly in Sweden and the US. Over 40 countries are now using the InterRAI assessment tools for an increasing number of domains, care settings and disabilities.
Disability	· Outcomes measures related to disability are partially available through the InterRAI assessment systems in eight provinces through the CCHS Health Utilities Index and on a small scale through pilot-data collection of patient-reported outcomes measures.	Established use of PROMs in the UK and, increasingly, in Sweden and the US. 40 countries are using the InterRAI assessment tools for an increasing number of domains, care settings and disabilities.
Discomfort	· Canadian provinces are at the preliminary stages of introducing patient-reported outcome measures.	Established use of PROMs in the UK and, increasingly, in Sweden and the US.
Dissatisfaction	· A standardized pan-Canadian Patient Experience Reporting Survey for acute care services currently is being implemented in five provinces: British Columbia, Alberta, Manitoba, Ontario and New Brunswick. · The redesigned CCHS survey administered by Statistics Canada (2015) includes internationally comparable questions adapted by the OECD from Commonwealth Fund surveys and related to patient experience with ambulatory care services. · The Commonwealth Fund Survey collects information about patient experience for Canada.	The UK, US, the Netherlands and Norway have made substantial progress in the measurement of patient experience (US Consumer Assessment of Healthcare Providers and Systems, UK NHS Patient Experience Framework and the Dutch Centre for Consumer Experience in Healthcare).

Source: Author's compilation.

experience and deliver better value for money. Table 3 below describes the state of outcomes measurement for each of the five domains of outcomes measurement identified previously and compares where Canada stands with other developed countries.

Outcomes Measurement: A Priority for Policymakers and Managers

Every five years, CIHI and Statistics Canada convene a national conference of health-sector stakeholders to consider priorities for health-information reporting and analysis. The fourth such pan-Canadian Consensus Conference on Health Indicators was held in October 2014 and received clear directions from national stakeholders (i.e., policymakers, systems managers, clinicians, researchers and patients asking for greater collection and use of outcomes measures at the patient and system levels in order to make better decisions, manage more effectively and provide better care (CIHI 2015a).

Enhancing the capacity to measure outcomes will require better and more extensive data collection, data linkage and greater use of electronic health records (EHRs). Currently, assessments of health-system performance in Canada are largely unable to track the care trajectories of patients and related outcomes such as the succession and interactions of encounters with the healthcare system and longer-term outcomes of patients once they leave care settings.

Despite significant advances in health information infrastructure over the last two decades, in most cases we lack the data or ability to link data that makes these trajectories visible. Data linkage and EHRs can provide the means for enhancing such visibility. At root, development of capacity in these areas is less about overcoming technical challenges than about creating the regulatory environment in which this can be done in ways that ensure balancing the need to protect privacy while meeting information needs (Protti 2015).

Using QALYs for Decision-making

Although Canadian researchers have been at the forefront in the development of QALY methodologies, their use in Canada remains limited. Independent agencies such as the Canadian Agency for Drugs and Technology in Health (CADTH), Health Quality Ontario and l'Institut National d'Excellence en Santé et en Services Sociaux in Quebec all use QALYs when conducting evaluations of new drugs, diagnostic tests and procedures in order to provide healthcare decision-makers with guidance in the face of rapid technological and pharmacological change. QALYs also have applications beyond the evaluation of drugs and devices and could be used more broadly when new areas of use increase (Husereau 2011).

How PROMs and PREMs Can help

While Canada is in the early stages of PROM data collection and reporting, PROMs have become a centrepiece of outcomes measurement in Sweden, the UK and parts of the United States (Black 2013). In the UK, PROMs were first implemented in 2008, and their use has been expanded and made mandatory in certain areas such as elective surgeries. They are now included in the National Health Service (NHS) Outcomes Framework (NHS Group, Department of Health 2014), specifically within the domains of enhancing quality of life for people with long-term conditions and ensuring people have a positive experience of care (see Table 1).

In February 2015, CIHI hosted a pan-Canadian PROMs forum aimed at highlighting the importance of collecting outcome measures, sharing best practices and experience, and holding discussions on a framework to guide future initiatives. Participants identified a range of useful PROMs for policymakers and patients (Table 4) (CIHI 2015b).

Patient perceptions of their care can also guide service improvement and inform the redesign of the healthcare experience (health-system responsiveness). Meanwhile, PREMs go well

Table 4: Value of PROMs Identified by Canadian Stakeholders

Stakeholder	Uses
Health-System Policymakers/ System Managers	· Compare outcomes locally, regionally and provincially over time, as well as with similar regions and jurisdictions. · Compare different care models and clinical pathways for outcomes analysis. · Support health-service allocation decisions informed by information about the relative cost of achieving desired outcome states ("value-based care"). · Identify clinical organizations and/or regions that would benefit from further support in building better capacities to improve outcomes.
Health Care Organizations	· Monitor organization and provider performance, compare with peer organizations and identify organizations with high outcomes scores for engagement and improvement. · Identify areas and providers that would benefit from further education and support.
Health Care Providers	· Direct feedback that can be used to modify patient care pathways and provide evidence toward improving or maintaining a high level of care and expected outcomes. · Support improved clinician-patient communication and raise awareness of problems that would otherwise be unidentified. · Facilitate performance comparisons with expected standards.
Patients	· Opportunity to provide input from their perspective and to be more aware of expected outcomes and how they compare. · Opportunity to provide feedback independent of their provider's view and also potentially identify providers with poor outcomes results. · Enhance communication with care providers and patient involvement in care planning and decision-making.

Source: CIHI 2015b.

beyond the limited focus of satisfaction surveys to hone in on the experience of care itself, such as whether it was perceived as respectful and whether the patient was involved in treatment decisions. PREMs can prove particularly valuable in improving interactions with healthcare personnel and addressing challenges with access, navigability of facilities and gaps in services.

The publication of patient experience results has also been advanced as supporting patient choice. However, there is yet little evidence supporting the argument that greater access to information by patients leads to different care-consumption patterns, particularly in contexts where access challenges limit patient options.

Though interest is increasing across Canada, the collection of patient-reported experience measures is still in very preliminary stages, and we lag behind other countries that have established initiatives such as the US Consumer Assessment of Healthcare

Providers and Systems, the UK NHS Patient Experience Framework and the Dutch Centre for Consumer Experience in Healthcare.

Part 3. Strengthening Outcomes Measurement in Healthcare in Canada

The collection, reporting and use of outcome measures in decision-making are critical to creating better value for health systems. The investments made to develop health-outcomes measurement should aim to strengthen information infrastructure and improve quality of care and policy development. In addition, improved health-system management recommendations speak specifically to governance and incentives that ensure appropriate alignment with health-system goals.

There are several initiatives that would strengthen the collection and dissemination of outcomes measurement in the Canadian healthcare sector.

(1) Canada already benefits from a strong data infrastructure with high-quality administrative, survey, census and vital statistics. Further investments should be made by the federal and provincial governments to complement this infrastructure with outcome measures of relevance to patients, clinicians, system managers and policy practitioners. In particular, patient-reported outcome measures and patient reported experience measures should augment datasets currently available in pan-Canadian clinical registries. In addition, cost information should be expanded to cover the continuum of care and inform better policymakers on the value of specific interventions benefiting patients.

(2) Additional efforts to strengthen underlying information systems should focus on developing a national, standardized approach to the systematic measurement of patient experiences across the continuum of care, improving the coding of secondary causes of death and continuing the adoption across Canada of outcome measurement tools developed by the interRai international collaborative network.

High-quality surveys administered by Statistics Canada such as the CCHS should be augmented by a common instrument measuring population-level health outcomes like the EQ5D or Veterans RAND (VR) 12 instruments currently being explored in Alberta and British Columbia. As well, longitudinal surveys such as the Canadian study on ageing should be exploited to deliver better information on health outcomes over time.

(3) The expansion of electronic health and medical records should include the collection of minimum data sets (content standards), allowing for pan-Canadian comparisons. The data should include measures of patient experience and patient-reported outcomes for use by clinicians, system managers and policy practitioners. In the near future, we should be routinely capturing data about relevant symptoms and quality of life before and after every significant intervention (e.g., joint replacement, use of a new drug, etc.).

(4) Further efforts should be made by national health information agencies and research organizations to link datasets across the care continuum and more broadly with other types of datasets influencing health outcomes such as education, housing and employment datasets. Such linkage should be done in a way that, while respecting privacy, maximizes the use of information for policymaking, system management and clinical care.

(5) Opportunities to augment linked national datasets with data from the private sector (for example, from insurance companies or from workers' safety compensation agencies) should be explored with a view to maximizing the use of this information while respecting patient and workers privacy safeguards.

(6) Organizations with a mandate to report publicly on health-system performance, such as CIHI and provincial health quality councils, should expand

their data collection efforts to report publicly on outcomes, filling current gaps in outcomes measurement and public reporting.

(7) With appropriate data risk-adjustments in place, measurement and public reporting of clinician-level outcomes (e.g., mortality rates for patients of individual cardiac care surgeons) should be considered. The development of clinician-level outcome indicators should ideally be led by societies of specialists. Reporting should be done privately to individual clinicians until there is enough confidence that methods are robust enough to support public disclosure. The UK NHS, for example, reports outcomes for individual specialists and family practices. In the US, the Physician Quality Reporting System encourages "eligible professionals" – those paid through Medicare – to report information on the quality of their care. While the information is not made public, the system enables peer comparisons. Beginning in 2015, negative payment incentives will be implemented to encourage further participation in this benchmarking mechanism.

How to Use Health-System Outcome Measures

Porter and Lee propose five components in their patient value agenda (2013), in addition to building an enabling technology platform. They consist of: (i) organizing care into integrated practice units; (ii) measuring outcomes and costs for every patient; (iii) moving to bundled payments for care cycles; (iv) integrating care delivery across separate facilities; and (v) expanding excellent services across geography.

These recommendations are aligned and supportive of current policy in a number of provinces that are attempting to introduce alternative care delivery models, integrating services for high-needs, high-cost patients. As well, these alternatives are characterized by payment schemes that incent providers to deliver services meeting minimum clinical requirements, pay for bundles of care across cycles organized around the patient experience rather than by provider silo and, more broadly, integrate care across different facilities. To be successful, these policy experiments are highly dependent on the generation of timely, accessible information on care outcomes and costs.

Accordingly, we recommend that:

(1) Provincial governments:

i. define health-sector targets to be reached with available resources;

ii. ensure that PROMS and other clinical outcome measures are embedded in future funding models, together with costing data integrated across the continuum of care;

iii. provide agencies responsible for evaluating new drugs and technologies with the regulatory power to enforce their recommendations;

iv. strengthen their ability to benchmark and learn from innovations to improve health outcomes and compare their approach to the impact of outcomes measurement and reporting in other sectors such as education; and

v. communicate desirable goals and targets to health professionals, with their engagement throughout the development and use of outcomes data.

(2) Regional health authorities and healthcare delivery organizations shift their accountability approaches from volume and quality of care only to include outcomes measurement in their sets of key performance indicators and report publicly on their plans to improve outcomes and related results.

(3) CIHI, Statistics Canada and provincial health-quality councils accelerate their efforts to regularly report better measures of health-system outcomes and healthcare costs with the objective of informing the general public about the value created by the Canadian health system for Canadians.

(4)) The federal Canadian Institutes for Health Research and other health research funders provide incentives to the health-services research community to deliver a more ambitious research program on outcomes measurement and improvement.

Conclusion

The use of health-outcome indicators can inform policy debates among, and within, provinces about how to improve outcomes while enabling knowledge-sharing about the effectiveness of different policies, procedures and strategies. We see the growth in measuring health outcomes and disseminating the results as important aspects in improving the value of health services and enabling broader change. Certainly, in other public services like public education better outcomes measurement over time has led to more structured, evidence-based debates on policy and quality.

There are some international examples of successes that have arisen due to the collection of better health data, but widespread use and measured improvements have not been fully accomplished yet in any advanced nation. Producing quality outcomes data is not sufficient – such data must lead to advancement of health-system goals. Achieving this will require not only the appropriate analysis of the data but also integration with elements of health-system design, such as financing and accountability rules.

A recent study by the King's Fund in England concluded that population-based health systems tend to deliver better outcomes and share the common characteristics of: (i) wrapping care integration around patients' and people's needs with proper planning for health and equity; (ii) pooling data from various population and equity perspectives and analyzing data with a view to improving outcomes; (iii) designing proper incentives that align with better population health objectives (in particular, health promotion and disease prevention); (iv) supporting action on social determinants of health; and (v) better engaging and empowering patients and society at large, including the private sector and not-for-profit sector (Alderwick et al. 2015).

These characteristics give a sense of the coordinated policy interventions required to achieve substantially better health outcomes. Better measurement of health sector outcomes will give policymakers and the public a concrete sense of where we are, where we want to go and how well we are doing in getting there. It is an important step towards building a healthcare system delivering value to Canadians.

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